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BY EXPRESS MAIL

Date: December 30, 1997
Inventors: Joel Vidal and Ari Krashin
Title: HIGH CAPACITY COMPACT DISK PLAYER
Attorney Docket No.: 6317/2

Box Patent Application
Assistant Commissioner for Patents
Washington, D.C. 20231

Dear Sir/Madam:

We enclose for filing the above-identified patent application. We also enclose:

(1) Two (2) sheets of formal drawings;

(2) Appendix A to Application, on microfiche (in clear plastic envelope);

(3) A Declaration and Power of Attorney;

(4) Associate Power of Attorney and New Correspondence Address;

(5) Verified Statement (Declaration) Claiming Small Entity Status;

(6) A check drawn on Gottlieb, Rackman & Reisman, P.C. Operating Expense Account for the amount indicated below:

Small Entity Fee Computation:	
Basic Fee:	$395.00
Total claims: 34 - 20 = 14 x $11 =	154.00
Indep. claims: 4 - 3 = 1 x $41 =	41.00
TOTAL	$590.00

(7) The Commissioner is authorized to charge any additional fees that may be required, or to credit any overpayment, to our Deposit Account No. 07-1730.

Very truly yours,

GOTTLIEB, RACKMAN & REISMAN

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HIGH CAPACITY COMPACT DISK PLAYER

FIELD OF THE INVENTION

The present invention relates generally to the field of audio recording and playing, and specifically to audio compact disks players.

BACKGROUND OF THE INVENTION

Compact disks (CDs) are storage devices for audio signals encoded as digital data. Audio CD players convert the CD digital data to analog data, which are directly reproducible as audio signals.

Conventional CDs contain digitized audio data, generally without any data reduction or compression. They are typically capable of storing 650 megabytes of data, which is roughly equivalent to 74 minutes of high-quality standard audio transmission. The conventional audio CD is relatively impervious to normal usage, user-friendly, inexpensive to manufacture, and produces high-quality sound.

The Moving Picture Experts Group (MPEG) has defined encoding standards for moving pictures and audio signals. MPEG encoding compresses signals using encoding algorithms that produce a slightly less than exact reproduction of the picture, or audio signal, but in a way that is normally largely unnoticeable to the human senses. The MPEG standards for encoding audio signals are known as MPEG Audio Layers-1, -2 and -3, with each layer being progressively more compressed than that before it. Layer-1 compresses digital audio data approximately 4-fold; Layer-2, 6- to 8-fold; and Layer-3, 10- to 12-fold. Whereas uncompressed analog-to-digital encoding requires nearly 10 megabytes of data for 1 minute of high-quality stereo sound, with MPEG Layer-3 encoding, the same 1 minute of high-quality stereo sound requires less than 1 megabyte of data.

MPEG encoding is used for visual and video encoding, for example, in DVDs (Digital Video Disks), which are viewable on MPEG-enabled DVD video players. Fraunhofer Gesellschaft IIS-A, of Erlangen, Germany, offers MPEG-encoded audio/visual CD-ROMs designed for use with a personal computer having a sufficiently powerful CPU and suitable decoding software. MPEG Layer-3 audio encoding is also available for use in computers, network-based radio, and other applications that require large audio signal data bases.

To date MPEG compression and decompression require the use of a computer. For on-line, real-time play, particularly of MPEG Layer-3, which is relatively computation-intensive, a powerful computer, based at least on an Intel Pentium MMX processor, for example, is generally needed. Consequently, MPEG audio compression has not been applied to home entertainment or portable audio devices.

European Patent Application EP 0786774 describes a digital portable stereo headphone player for recording and playback of compressed audio data on a mini-disk. The player includes a compression/expansion circuit, but no details of this circuit are described. The player is complex and appears to have many of the features of a personal computer system.

European Patent Application EP 0772192 describes optical disk playback apparatus, which is capable of receiving disks that include either compressed or non-compressed audio data. If a disk including compressed data is received, the apparatus converts the data to non-compressed data.

SUMMARY OF THE INVENTION

It is an object of some aspects of the present invention to provide a personal audio device that can play audio CDs having extended playing time, preferably at least 800 minutes of playing time.

It is a further object of some aspects of the present invention to provide a system for producing extended-play audio CDs for home and mobile use, preferably using standard-size (12 cm diameter), widely available CD media.

In some preferred embodiments of the present invention, a CD player includes an integrated circuit chip, referred to herein as an MPEG decoder chip, or as an MPEG decompression chip, to decode compressed, MPEG-encoded audio data and read it as digital audio signals. The player receives long-play CDs including digital audio data that have been compressed according to the MPEG standard. The compressed data are read from the CD and passed to the chip, which decodes the data and outputs a stream of standard, uncompressed CD audio data, thereby enabling real-time, on-demand use of MPEG-encoded audio CDs without the necessity of a large and costly computing circuitry.

Preferably, the encoded audio data are compressed at least 4-fold, more preferably at least 8-fold, using MPEG Layer-1 or Layer-2 encoding, respectively. Most preferably, the data are compressed approximately 12-fold, based on the level of compression that is typically achieved using MPEG Layer-3 audio compression. The audio player is thus capable of receiving and playing long-play CDs including 12 times the conventional 74 minutes, or approximately 888 minutes (14.8 hours) of high-quality stereo music or voice recording.

Preferably, the MPEG decoder chip comprises a custom or application-specific integrated circuit, which is fabricated with firmware capability to decompress MPEG

Layer-3 encoded audio data in real time. MPEG decoding algorithms are known in the art, but are typically implemented in software using general-purpose computer processors. The CD player of the present invention may include such a general-purpose processor, but those skilled in the art of integrated circuits will appreciate that a custom integrated circuit may be designed and fabricated to implement the MPEG decoding more efficiently and at a lower production cost than the general-purpose processor.

In one preferred embodiment of the present invention, the CD player is used as a component of a home entertainment system. In other preferred embodiments, the MPEG decoder chip is installed in a mobile CD player, for example, a personal portable CD or an automobile CD player. The present invention is particularly advantageous in these mobile applications, since it relieves the user of the need to carry around a large number of short-play (74 minute) CDs. Replacing multiple short-play CDs with one or a few long-play CDs, will also save on storage space in the home, office or vehicle. The CD player, be it the mobile or home entertainment version, is preferably equipped with all the common features and functions of a standard CD player, such as play, stop, pause, forward, rewind, display of track numbers, display of elapsed playing time, etc.

In other preferred embodiments of the present invention, a CD recording system comprises two CD drives: a read drive and a write drive. The read drive receives and reads conventional, non-compressed audio CDs. Data read by the read drive (either entire CDs or specific track(s) as selected by the user) are compressed, preferably using MPEG audio encoding, most preferably MPEG Layer-3. The compressed data are then written onto a recordable CD in the write drive, thus enabling 888 minutes (14.8 hours) of high-quality stereo sound to be

recorded on a conventional CD, which normally would hold only 74 minutes of sound. The compression is preferably performed by an MPEG Layer-3 encoder chip, similar in principle to the decoder chip described above.

By using MPEG Layer-3 encoding, the system can condense the entire contents of as many as 12 conventional fully-recorded CDs onto a single, long-playing CD. (In fact, since commercially-recorded CDs are usually not recorded to their full 74 minute capacity, but rather to about 80% capacity, it may be possible to condense up to 15 conventional CDs onto a single long-playing CD.) A user of the recording system can record audio segments from the conventional CDs onto the long-playing CD in any desired sequence and combination. The long-playing CD produced in this manner is particularly suited for use in the CD player described above, but can also be used in a computer CD drive, for example, using software decompression and an appropriate computer sound-card and speakers to play back the recorded audio.

Alternatively, the CD recording system may comprise only a single read/write CD drive, along with a fixed mass-memory device, such as a magnetic hard disk. In this case, the conventional CDs, on which non-compressed audio data are recorded, are first inserted one by one into the drive. The audio data are read from the CDs, compressed, preferably using MPEG audio compression, most preferably MPEG Layer-3 encoding, then temporarily stored in the mass-memory device. Then the recordable CD is inserted into the same read/write CD drive, and the stored, compressed data from the mass-memory device are recorded on the CD.

While preferred embodiments of the present invention are based on MPEG audio compression, and particularly MPEG Layer-3 compression, it will be appreciated that the principles of the present invention may also be applied

to produce audio players and recording systems based on other compression schemes, including MPEG audio Layer-4 encoding currently under development.

There is therefore provided, in accordance with a preferred embodiment of the present invention, a CD player, including:

a CD drive, which receives a CD and reads compressed digital audio data recorded thereon; and

an integrated circuit chip, which decompresses the compressed data and produces a non-compressed audio output.

Preferably, the data are compressed by MPEG compression, and more preferably, by MPEG Layer-3 compression.

Preferably, the data are compressed at least 4-fold, more preferably at least 8-fold, and most preferably approximately 12-fold.

Preferably, the chip includes firmware for decompressing the data.

Preferably, the chip includes a custom integrated circuit chip and does not include a general purpose processor.

Preferably, the CD player includes a mobile personal audio player, which is preferably installed in a vehicle.

There is further provided, in accordance with a preferred embodiment of the present invention, a CD recording system, including:

a read drive, which receives and reads a first CD having audio data recorded thereon;

compression circuitry, which receives and compresses the audio data from the read drive; and

a write drive, which receives the compressed data and records the compressed data on a second, recordable CD.

Preferably, the circuitry compresses the data by MPEG compression, and more preferably, by MPEG Layer-3

compression. Preferably the circuitry includes firmware for compressing the data.

Preferably the circuitry compresses the data at least 4-fold, more preferably at least 8-fold, and most preferably approximately 12-fold.

There is further provided, in accordance with a preferred embodiment of the present invention, a method for playing a long-playing audio CD, including:

reading compressed digital audio data from the CD; and

decompressing the data using a custom integrated circuit chip; and

converting the decompressed data to analog form.

Preferably, decompressing the data includes decompressing by MPEG decoding, and more preferably by MPEG Layer-3 decoding.

Preferably, decompressing the data includes decompressing by at least 4-fold, more preferably by at least 8-fold, and most preferably by approximately 12-fold.

Preferably reading the compressed data includes playing the CD in a mobile personal audio player, preferably in a CD player installed in a vehicle.

There is further provided, in accordance with a preferred embodiment of the present invention, a method for producing a long-playing audio CD, including:

reading digital audio data from a prerecorded CD;

compressing the data using MPEG compression; and

recording the compressed data on the long-playing CD.

Preferably compressing the data includes compressing by MPEG Layer-3 compression.

Preferably compressing the data includes compressing by at least 4-fold, more preferably, by at least 8-fold, and most preferably, by approximately 12-fold.

Preferably, reading the data includes reading data from a plurality of prerecorded CDs.

Furthermore, reading the data preferably includes inserting each of the plurality of CDs in sequence into a read drive, in order to read data therefrom.

Preferably, recording the data includes recording data on the long-playing CD in an order that is different from the order of the data on the prerecorded CD.

BRIEF DESCRIPTION OF THE DRAWINGS

The present invention will be more fully understood from the following detailed description of the preferred embodiments thereof, taken together with the drawings in which:

Fig. 1A is a simplified pictorial illustration of a CD drive, in accordance with a preferred embodiment of the present invention;

Fig. 1B is a schematic block diagram illustrating the operation of the drive of Fig. 1A;

Fig. 2A is a simplified pictorial illustration of a CD recording system with dual CD drives, in accordance with another preferred embodiment of the present invention; and

Fig. 2B. is a schematic block diagram illustrating the operation of the system of Fig. 2A.

DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS

Reference is now made to Figs. 1A and 1B, which schematically illustrate a CD player 20, in accordance with a preferred embodiment of the present invention. Fig. 1A is simplified pictorial illustration, and Fig. 1B is a schematic block diagram of the CD player.

A long-playing CD 24, on which compressed digital audio signals are encoded, preferably using MPEG Layer-3 compression, is inserted into a CD drive 22 in MPEG-enabled CD player 20. An optical read head 26 reads the compressed data on CD 24, and transfers the data to an MPEG decoder chip 28. Chip 28 reads the data, and via algorithms known in the art, decodes the compressed MPEG digital data. The uncompressed data is then transferred from chip 28 to a D/A converter 30. Converter 30 converts the digital data to analog data, as is known in the art, and passes the analog data, which are directly reproducible as audio signals, to speaker 32 or to another output device or output socket (such as headphones or amplifier - not shown).

It is noted that the scan pattern and/or scan speed to read head 26 over the surface of CD 24 may be adjusted to accommodate the high density of information on the CD. Also, buffer memories may be introduced between read head 26 and chip 28 and/or between chip 28 and D/A converter 30, in order to ensure a smooth, properly timed stream of audio data from CD 24 to speaker 32.

CD player 20 may be located either in a home audio entertainment center, a portable CD player, a car CD player or any other form of personal CD player, thus enabling a user to hear up to 888 minutes of high-quality stereo listening entertainment from a conventionally sized CD instead of the conventional 74 minutes. Additionally, CD player 20 may also be equipped to play conventional short-play CDs if desired. For this purpose, chip 28 is preferably capable of identifying

whether the data read by head 26 is encoded or not; if not, no decoding will take place, and direct digital-to-analog playback will occur.

Chip 28 is preferably a custom VLSI chip, incorporating a suitable processor and firmware, stored on the chip, for decoding compressed MPEG digital audio data, including Layer-3 encoded data. Methods of real-time decoding MPEG Layer-3 digital audio data are known in the art. For example, a suitable MPEG decoding software program, known as AMP (Audio MPEG Player), version 0.7.5, which runs on a Pentium-type processor in a personal computer, is incorporated hereinbelow as Appendix A. It is within the capabilities of semiconductor manufacturers to design and produce chip 28 so as to implement the program listed in Appendix A or another, similar program. It will be understood, however, that the functions of chip 28 in CD player 20 could also be performed using one or more chips of other types, for example, one or more ASIC chips and/or a general-purpose processor together with requisite peripheral and/or memory components.

Figs. 2A and 2B schematically illustrate a CD recording system 40, useful particularly for producing long-playing disks to be played in player 20, in accordance with a preferred embodiment of the present invention. Fig. 2A is simplified pictorial illustration of system 40, and Fig. 2B is a schematic block diagram illustrating the operation of the system shown in Fig. 2A.

Recording system 40 comprises a CD read drive 42 and a CD write drive 44. A conventional CD 50, containing uncompressed audio data, is inserted into drive 42, and a blank, recordable CD 52 is inserted into drive 44. Digital audio data from CD 50 is read by optical read head 26, which transfers the data to compression circuitry 46. Circuitry 46 compresses the digital data,

preferably using MPEG Layer-3 encoding, as is known in the art. Circuitry 46 may comprise a custom VLSI or ASIC chip or, alternatively or additionally, a general-purpose processor with suitable software, as well as requisite memory components and/or peripheral devices. Compressed data is transferred from circuitry 46 to a write head 54 in drive 44, which records the data onto CD 52.

Preferably, a user of system 40 chooses one or more tracks of CD 50 to be read, compressed and written onto CD 52 in any desired order. Thereafter, CD 50 is removed and replaced with another CD, from which audio data is read. This operation may be repeated numerous times, thus allowing recording of approximately 888 minutes (14.8 hours) of high-quality stereo audio sound onto one recordable, long-playing CD 52, based on the 12-fold compression that can be achieved using MPEG Layer-3. CD 52 can then be played in a portable CD player, such as player 20 shown in Figs. 1A and 1B, thereby replacing numerous cumbersome conventional (74 minute) short-playing CDs with one 888 minute long-playing CD, and enabling the user the freedom of extended listening with one CD.

In an alternative preferred embodiment, circuitry 46 also includes decoder chip 28, or other decompression circuitry, and thus performs both the function of compression to MPEG standard encoding and decompression from MPEG standard encoding, thus enabling recording system 40 to function also as a playback device for long-play 888 minute CDs, similar to long-play CD player 20.

In still another alternative embodiment, not shown in the figures, system 40 may comprise only a single read/write CD drive, along with a fixed mass-memory device, such as a magnetic hard disk. In this case, conventional CDs 50 are first inserted one by one into the drive. The audio data are read from the CDs, compressed by circuitry 46, then temporarily stored in

the mass-memory device. Then recordable CD 52 is inserted into the same read/write CD drive, and the stored, compressed data from the mass-memory device are recorded on the recordable CD.

It will be appreciated that the preferred embodiments described above are cited by way of example, and the full scope of the invention is limited only by the claims.

SOFTWARE APPENDIX

The computer software listing attached hereto comprises source code files for AMP (Audio MPEG Player), written in the C programming language. This code, which is available for download via the Internet at ftp://ftp.rasip.fer.hr/pub/mpeg, may be compiled using any suitable C-language compiler and run on any of a variety of operating platforms, for example, under the Microsoft Windows 95 operating system on a personal computer that is equipped with an Intel Pentium MMX processor. The code is covered by copyright and may be used commercially only subject to the agreement of the copyright holder.

CLAIMS

1. A CD player, comprising:

a CD drive, which receives a CD and reads compressed digital audio data recorded thereon; and

an integrated circuit chip, which decompresses the compressed data and produces a non-compressed audio output.

2. A CD player according to claim 1, wherein the data are compressed by MPEG compression.

3. A CD player according to claim 2, wherein the data are compressed by MPEG Layer-3 compression.

4. A CD player according to claim 1, wherein the data are compressed at least 4-fold.

5. A CD player according to claim 4, wherein the data are compressed at least 8-fold.

6. A CD player according to claim 5, wherein the data are compressed approximately 12-fold.

7. A CD player according to claim 1, wherein the chip includes firmware for decompressing the data.

8. A CD player according to claim 1, wherein the chip comprises a custom integrated circuit chip.

9. A CD player according to claim 1, wherein the chip does not comprise a general purpose processor.

10. A CD player according to claim 1, wherein the CD player comprises a mobile personal audio player.

11. A CD player according to claim 10, wherein the CD player is installed in a vehicle.

12. A CD recording system, comprising:

a read drive, which receives and reads a first CD having audio data recorded thereon;

compression circuitry, which receives and compresses the audio data from the read drive; and

a write drive, which receives the compressed data and records the compressed data on a second, recordable CD.

13. A system according to claim 12, wherein the circuitry compresses the data by MPEG compression.

14. A system according to claim 13, wherein the circuitry compresses the data by MPEG Layer-3 compression.

15. A CD system according to claim 12, wherein the circuitry includes firmware for compressing the data.

16. A CD system according to claim 12, wherein the circuitry compresses the data at least 4-fold.

17. A CD system according to claim 16, wherein the circuitry compresses the data at least 8-fold.

18. A CD system according to claim 17, wherein the circuitry compresses the data approximately 12-fold.

19. A method for playing a long-playing audio CD, comprising:

reading compressed digital audio data from the CD; and

decompressing the data using a custom integrated circuit chip; and

converting the decompressed data to analog form.

20. A method according to claim 19, wherein decompressing the data comprises decompressing by MPEG decoding.

21. A method according to claim 20 wherein decompressing the data comprises decompressing by MPEG Layer-3 decoding.

22. A method according to claim 19, wherein decompressing the data comprises decompressing by at least 4-fold.

23. A method according to claim 22, wherein decompressing the data comprises decompressing by at least 8-fold.

24. A method according to claim 23, wherein decompressing the data comprises decompressing by approximately 12-fold.

25. A method according to claim 19, wherein reading the compressed data comprises playing the CD in a mobile personal audio player.

26. A method according to claim 19, wherein reading the compressed data comprises playing the CD in a CD player installed in a vehicle.

27. A method for producing a long-playing audio CD, comprising:

reading digital audio data from a prerecorded CD;

compressing the data using MPEG compression; and

recording the compressed data on the long-playing CD.

28. A method according to claim 27, wherein compressing the data comprises compressing by MPEG Layer-3 compression.

29. A method according to claim 27, wherein compressing the data comprises compressing by at least 4-fold.

30. A method according to claim 29, wherein compressing the data comprises compressing by at least 8-fold.

31. A method according to claim 30, wherein compressing the data comprises compressing by approximately 12-fold.

32. A method according to claim 27, wherein reading the data comprises reading data from a plurality of prerecorded CDs.

33. A method according to claim 32, wherein reading the data comprises inserting each of the plurality of CDs in

sequence into a read drive, in order to read data therefrom.

34. A method according to claim 27, wherein recording the data comprises recording data on the long-playing CD in an order that is different from the order of the data on the prerecorded CD.

ABSTRACT

A CD player, including a CD drive, which receives a CD and reads compressed digital audio data recorded thereon, and an integrated circuit chip, which decompresses the compressed data and produces a non-compressed audio output. Preferably, the data are compressed by MPEG compression, most preferably by MPEG Layer-3 compression, so that the data are compressed approximately 12-fold, and the CD contains over 800 minutes of high-quality stereo sound recording.

FIG. 1A

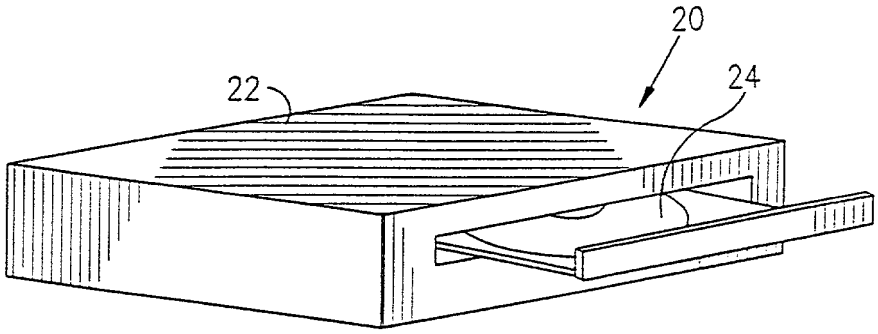


FIG. 1B

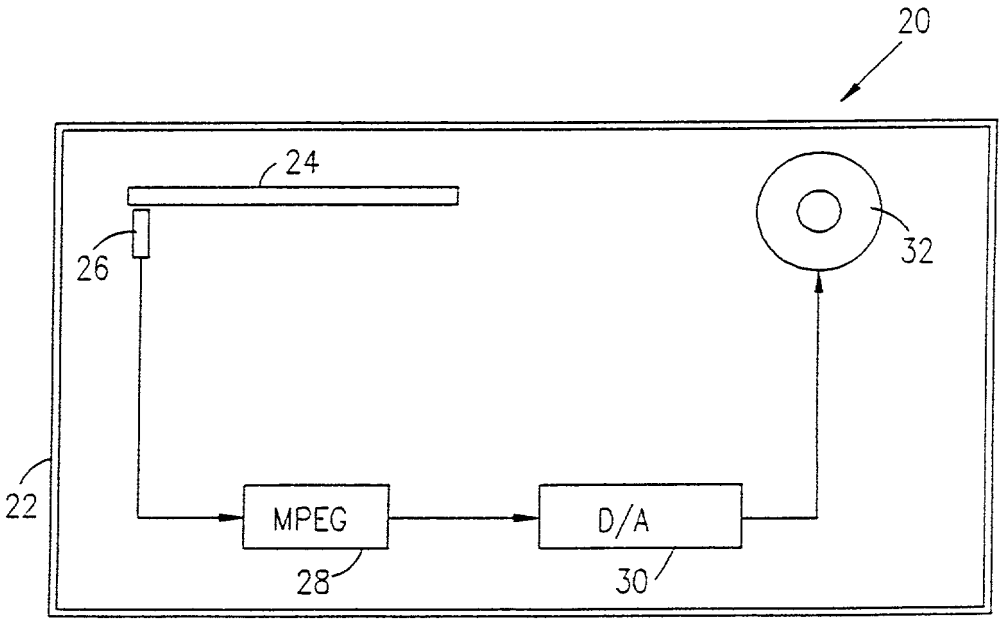


FIG. 2A

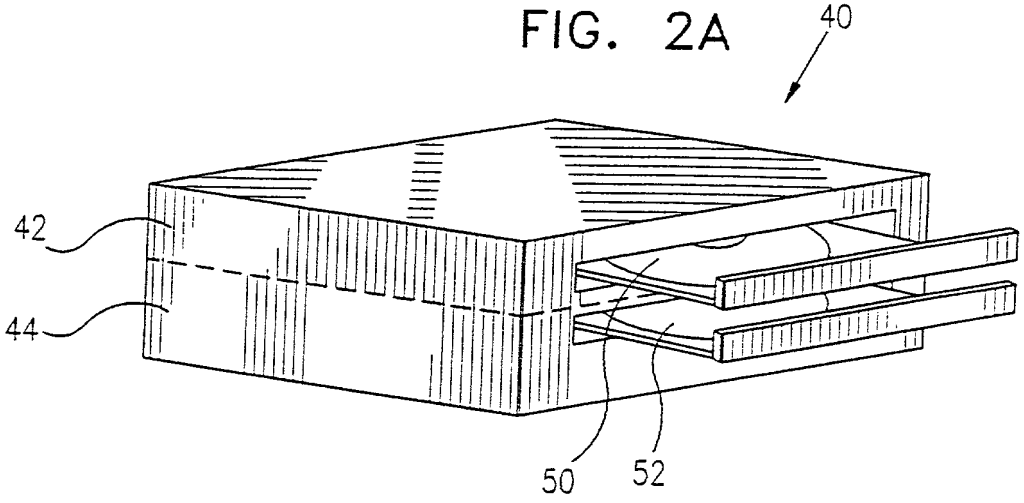
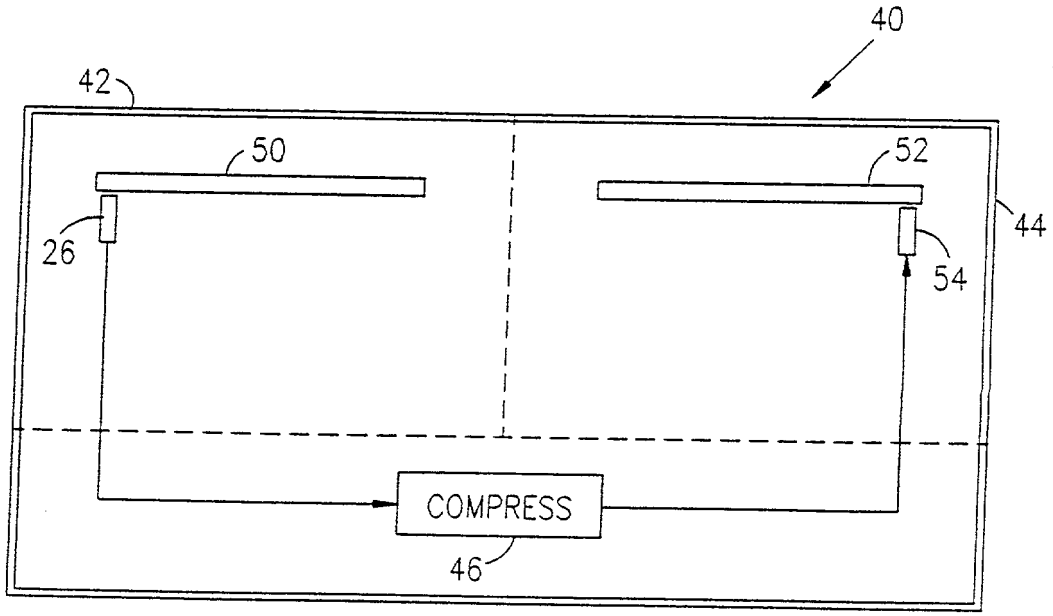


FIG. 2B



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant(s)	:	Joel Vidal and Ari Krashkin
Serial No.	:	
Filing Date	:	December 30, 1997
Title	:	HIGH CAPACITY COMPACT DISK PLAYER

ASSOCIATE POWER OF ATTORNEY
AND NEW CORRESPONDENCE ADDRESS

Assistant Commissioner
For Patents
Washington, D.C. 20231

S I R:

Please recognize the following individuals as associate attorneys for the above-captioned application filed herewith, all said individuals being members of Gottlieb, Rackman & Reisman, P.C., 270 Madison Avenue, New York NY 10016 (Telephone 212-684-3900; Facsimile 212-684-3999):

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Respectfully submitted,

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By: ______________________
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Reg. No. 31,565

Dated: New York, New York
December 30, 1997

"Express Mail" mailing label number: EM423444992US

Date of Deposit December 30, 1997

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Terry S. Landau

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Signature of person mailing paper or fee

Patent Application Declaration and Power of Attorney

As a below named inventor, I hereby declare that:
My residence, post office address, and citizenship are as stated below next to my name.
I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled: HIGH CAPACITY COMPACT DISK PLAYER
the specification of which (check one)

[X] is attached hereto
[ ] was filed on _____ as
Application Serial No. _____
and was amended on _____

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to the examination of this application in accordance with Title 37, Code of Federal Regulations, Section 1.56(a).

I hereby claim foreign priority benefits under Title 35, United States Code, Section 119 of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate having filing date before that of the application on which priority is claimed:

Prior Foreign Application(s)			Priority Claimed	
Number	Country	Day/Month/Year Filed	[ ] YES	[ ] NO

I hereby appoint the following attorneys, with full power of substitution, association, and revocation, to prosecute this application and to transact all business in the Patent and Trademark Office connected therewith:

Alfred Walker Reg. No. 29,983	Maria A. Savio Reg. No. 31,565	Franklyn Schoenberg Reg. No. 22,208

Address all correspondence to:	Direct all telephone calls to:
KUHN AND MULLER 405 Lexington Avenue New York, NY 10174	Alfred Walker, Esq. (212) 682-0864

I hereby further declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Full name of sole or first inventor:	Inventor's signature:	Date:
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Residence: Tel Aviv, Israel	Citizenship: Israel	
Post Office Address: 5 Feivel Street, Tel Aviv 62995, Israel		

Full name of second joint inventor:	Inventor's signature:	Date:
Ari KRASHIN	Ari Krashin	21 December 1997
Residence: Tel Aviv, Israel	Citizenship: Israel	
Post Office Address: 6 Uri Street, Tel Aviv 64954, Israel		

Applicant or Patentee: Joel Vidal and Ari Krashin Attorney's
Serial or Patent No.: Docket No.: 6317/2
Filed ~~or Issued~~: December 30, 1997
For: HIGH CAPACITY COMPACT DISK PLAYER

VERIFIED STATEMENT (DECLARATION) CLAIMING SMALL ENTITY STATUS (37 CFR 1.9(f) and 1.27(b)) - INDEPENDENT INVENTOR

As a below named inventor, I hereby declare that I qualify as an independent inventor as defined in 37 CFR 1.9(c) for purposes of paying reduced fees under Section 41(a) and (b) of Title 35, United States Code, to the Patent and Trademark Office with regard to the invention entitled:
HIGH CAPACITY COMPACT DISK PLAYER
described in
[X] the specification filed herewith
[ ] application serial no. ////////, filed ////////
[ ] patent no. ////////, issued ////////

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[X] no such person, concern, or organization
[ ] persons, concerns or organizations listed below *

* NOTE: Separate verified statements are required from each named person, concern or organization having rights to the invention averring to their status as small entities. (37 CFR 1.27)

FULL NAME ////////
ADDRESS ////////
[ ]INDIVIDUAL [ ]SMALL BUSINESS CONCERN [ ]NONPROFIT ORGANIZATION

I acknowledge the duty to file, in this application or patent, notification of any change in status resulting in loss of entitlement to small entity status prior to paying, or at the time of paying, the earliest of the issue fee or any maintenance fee due after the date on which status as a small entity is no longer appropriate. (37 CFR 1.28(b))

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application, any patent issuing thereon, or any patent to which this verified statement is directed.

Joel VIDAL	Ari KRASHIN
NAME OF INVENTOR	NAME OF INVENTOR
Joel Vidal	Ari Krashin
Signature of Inventor	Signature of Inventor
21 December 1997	21 December 1997
Date	Date